

PREPARATION OF TEA EXTRACTS FOR KOMBUCHA PRODUCTION

Kordialik-Bogacka Edyta, Hubert Antolak, Paulina Legumina, Anna Michalska, Katarzyna Dybka-Stępień, Anna Otlewska, Sylwia Ścieszka, Maciej Ditrych, Kamil Królak

edyta.kordialik-bogacka@p.lodz.pl

Lodz University of Technology
Faculty of Biotechnology and Food Sciences
Institute of Fermentation Technology and Microbiology

INTRODUCTION

Kombucha is a beverage obtained by fermentation of sugar-dissolved tea (*Camellia sinensis* L.), commonly black tea, by symbiotic culture of acetic acid bacteria, lactic acid bacteria and yeasts. Other tea types, namely green and oolong tea are the popular alternative to black tea. Both the tea type and the method of tea extract preparation have a large influence on tea medium composition and at last kombucha properties. Cold water steeping (5 °C or room temperature) can be a new way for infusion in order to maximise potential health benefits. The promising cold steeping technology requires, however, longer extraction.

AIM

The aim of this study was to determine the impact of infusion conditions on tea ingredients extraction. The effects of different steeping methods on various tea types (black, green and oolong) were investigated.

MATERIALS AND METHODS

Fifty grams of tea leaves or powder were added to 10 L of water. The extraction efficiency at various infusion parameters such as temperature (5°C, 20°C, and 85°C), time (2, 6, and 12 hours as well as 10 and 30 minutes), different water type (tap water versus distilled water) and various tea types (Black Kenia, Oolong, Green Sencha and the mixtures of Yunnan and Green Sencha as well as the mixtures of white tea and Green Sencha) was compared. For all tea infusions soluble substance content, colour, pH, acidity, polyphenol content and antioxidant capacity were measured. In total 97 experimental trials were conducted and the means of the results are presented.

Table 2. Characteristics of tea infusions

Type of tea	Extract [g/L]	pH	Total acidity [ml 1N NaOH/100 ml]	Polyphenols [mg GA/L]	Colour			% DPPH free radical scavenging	Reducing potential FeSO ₄ [mM/L]
					L	a	b		
50% Green Sencha + 50% White	1.18	6.52	0.34	166.88	99.34	-3.66	16.12	38.99	1.27
50% Green Sencha + 50% Yunnan	1.35	6.58	0.35	196.94	95.95	-0.44	18.97	46.10	1.57
30% Green Sencha + 70% Yunnan	1.74	6.26	0.39	164.47	95.71	0.04	23.91	39.59	1.13
Green Sencha	1.86	6.16	0.46	253.54	97.45	-2.70	22.19	55.74	2.28
Black Oolong	1.94	6.07	0.45	203.06	86.92	4.50	42.60	47.01	1.68
Black Kenia	2.27	6.74	0.24	190.69	88.78	1.93	35.19	44.29	1.48

RESULTS AND DISCUSSION

Hot infusion showed higher extractive power. However, cold infusion made for several hours resulted in similar extraction efficiency. The employment of a brief hot infusion step followed by cold water addition may represent an alternative approach for industrial tea extract preparation for kombucha fermentation.

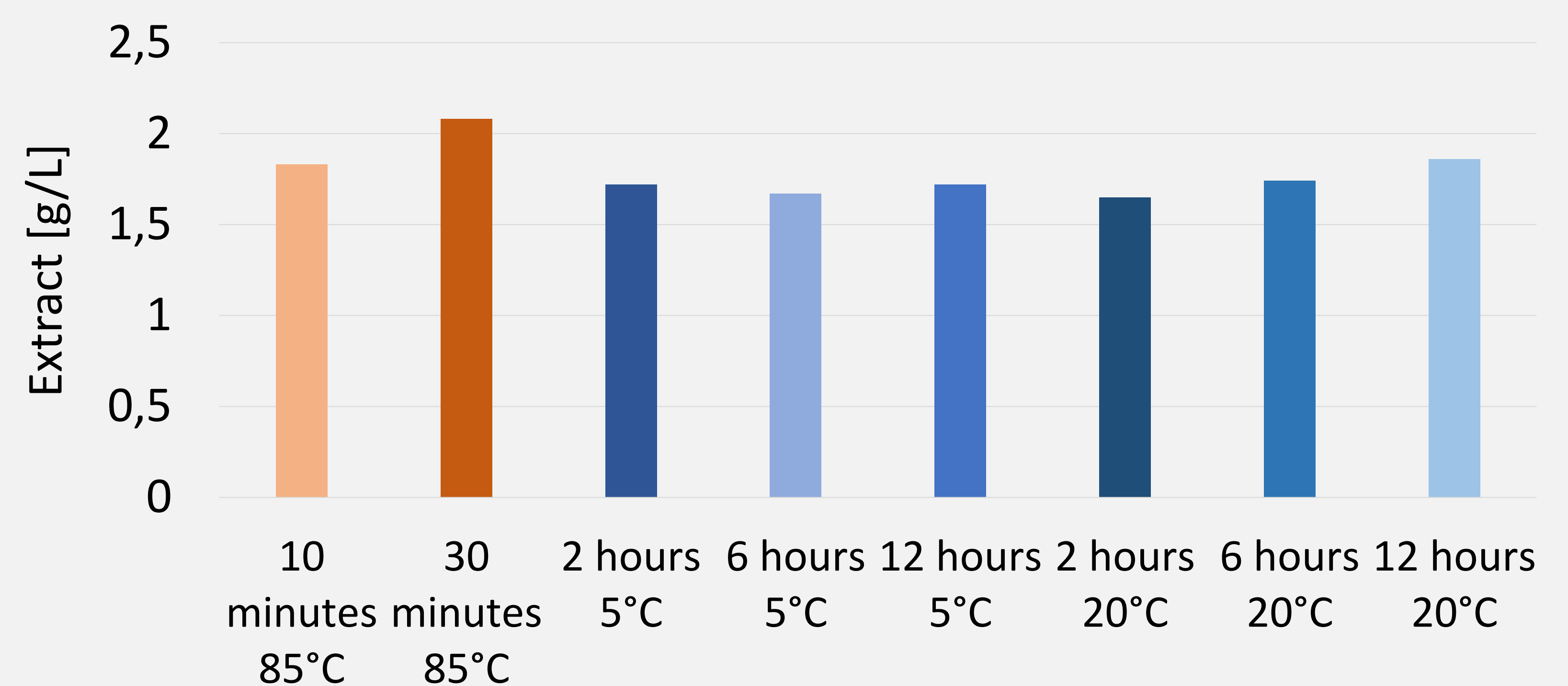


Figure 1. Extraction efficiency at different infusion conditions

Table 1. Tea infusions prepared with distilled or tap water

Type of water	Extract [g/L]	pH	Total acidity [ml 1N NaOH/100ml]
distilled	1.46	5.90	0.52
tap	2.02	6.54	0.33

Acknowledgements: The research was supported by the National Centre of Research and Development under the project “Development and implementation of innovative kombucha production technology” POIR.01.01.01-00-0910/20-00